Paper No. 15

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte LAWRENCE R. CUTTING, JOHN GERARD GAUDIELLO,
LUIS JESUS MATIENZO and NIKHIL MOHAN MURDESWAR

Appeal No. 2001-0445
Application No. 09/017,338

ON BRIEF

Before KIMLIN, MOORE and POTEATE, Administrative Patent Judges.

KIMLIN, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal from the final rejection of claims 12-17, all the claims remaining in the present application. Claim 12 is illustrative:

12. An electrical card structure, comprising:

a circuitized substrate having at least one wire bond pad located thereon;

a layer of a first metal substantially free of hydrogen molecules located on said wire bond pad; and

a thin layer of a second metal, different from said first metal, on said layer of said first metal.

The examiner relies upon the following reference as evidence of obviousness:

Makoto et al. (Makoto) JP 08-139148 May 31, 1996
(Japanese published unexamined patent application)

Appellants' claimed invention is directed to an electrical card structure having a wire bond pad located on a substrate and a layer of a first metal located on the wire bond pad. In addition, a thin layer of a second metal is located on the first metal. The first metal layer is substantially free of hydrogen.

Appealed claims 12-17 stand rejected under 35 U.S.C. § 103(a) as being patentable over Makoto.

Appellants submit at page 4 of the Brief that "[t]he claims are one group." Accordingly, all the appealed claims stand or fall together with claim 12.

We have thoroughly reviewed the respective positions advanced by appellants and the examiner. In so doing, we find that the examiner's conclusion of obviousness is not supported by the prior art evidence relied upon. Accordingly, we will not sustain the examiner's rejection.

At the outset, we are not persuaded by appellants' argument that Makoto does not disclose a wire bonded to a first layer

through a second layer inasmuch as wire 3 of Makoto is "not in any way in direct contact with first layer 6" (page 4 of Brief, penultimate paragraph). As properly noted by the examiner, claim 12, with which all the appealed claims stand or fall, does not require that a wire is in direct contact with the first metal layer. Indeed, appealed claim 12 fails to define any wire.

The flaw in the examiner's rejection is that there is no evidence that the first layer of Makoto is "substantially free of hydrogen molecules," as required by claim 12 on appeal. It is the examiner's position that appellants' specification discloses that the removal of hydrogen molecules from the first metal layer is dependent upon the temperature of heating and, since Makoto heats to a higher temperature than the temperature disclosed by appellants, the first metal layer of Makoto would necessarily be substantially free of hydrogen. In relevant part, appellants' specification, in the paragraph bridging pages 6 and 7, discloses the following:

> The palladium and gold layers are then heated in air to a temperature ≥185°C for a period of about 1 hour. During this heating step, hydrogen molecules entrapped in the palladium layer are driven out by the heat and released to the atmosphere by passing through the gold layer. It has been determined that the gold layer must be less than about 200 Angstrom thick for the hydrogen molecules to satisfactorily pass through and be released. It is believed at the present time that hydrogen molecules trapped in the palladium are

> the cause of poor bonding to palladium surfaces at temperatures below 200°C because hydrogen makes the plated palladium material surface harder. The present invention is known to release this hydrogen while preventing oxidation of the palladium surface during heating and prior to bonding a wire to the palladium through the gold. Furthermore, successful bonds using gold wire of 0.001 inch diameter have been made using the present invention without heating the palladium layer above 200°C.

Hence, according to appellants' specification, the second, or gold, layer must be less than about 200 Angstrom thick for the hydrogen molecules to satisfactorily pass therethrough. On the other hand, Makoto is silent with respect to the thickness of the second gold layer and, as noted by appellants, the figures of the reference depict the gold layer as essentially equal to the thickness of the copper and platinum layers. Although Makoto heats the circuit to a temperature of 430°C for six minutes, the examiner has not established that such heating would inherently or necessarily result in the first metal layer being substantially free of hydrogen molecules. It is well settled that inherency requires inevitability, not merely possibilities or probabilities. In our view, there is insufficient evidence of record to support the conclusion that the first metal layer of Makoto is substantially free of hydrogen, as required by the appealed claims.

In conclusion, based on the foregoing, the examiner's decision rejecting the appealed claims is reversed.

REVERSED

EDWARD C. KIMLIN Administrative Patent Judge	)	
JAMES T. MOORE Administrative Patent Judge	)	BOARD OF PATENT APPEALS AND INTERFERENCES
LINDA R. POTEATE Administrative Patent Judge	)	

ECK:clm

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